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| 10/625,386 | 07/23/2003 | Sundeeep Chauhan | STL10986 | 2363 |

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EXAMINER

NGUYEN, HAI L

| ART UNIT | PAPER NUMBER |
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2816

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,386

Applicant(s)

CHAUHAN, SUNDEEP

Examiner

Hai L. Nguyen

Art Unit

2816

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22, 25, 26 is/are rejected.
- 7) ☒ Claim(s) 23 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment received on 08/29/04 has been reviewed and considered with the following results:

As to the objections to the claims 9 and 19, Applicant's amendments do not overcome the prior art rejections. Therefore, the objections are maintained as set forth below.

As to the rejections to the claims, under 35 U.S.C. 112, 2nd paragraph, made in the previous Office Action mailed on 6/29/2004 are now withdrawn in view of Applicant's amendments and arguments.

As to the prior art rejections to the claims made in the previous Office Action are now withdrawn in view of Applicant's amendments. However, Applicant's amendments necessitate new ground of rejection as set forth below.

Claim Objections

2. Claims 9 and 19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The field-programmable gate array on the single monolithic integrated circuit limitations of claims 9 and 19 does not further define the phase/frequency comparator apparatus limitation of claim 8 and the phase locked loop limitation of claim 18. In other word, the field-programmable gate array on the single monolithic

Art Unit: 2816

integrated circuit is a broader, more encompassing structure, which does not further define the phase/frequency comparator and the phase locked loop.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claimed limitation that “A phase/frequency comparator that generates a phase error responsive to a transition location signal”, in claim 1, has not been enabled in the specification. Since, the specification does not enable the phase/frequency comparator having the claimed scope, i.e. it does not enable any and every means/or element for performing the recited function such as generating a phase error responsive to a transition location signal.

5. Claims 21 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claimed limitation that “combining the numerical phase difference value with a value in an accumulator to obtain a new accumulator value; and presenting the new accumulator value as a result of a phase comparison”,

Art Unit: 2816

in claim 21, has not been enabled in the specification. The details of such functions are not seen in the description of the preferred embodiment. It is not clear as currently defined, how the instant invention can perform the recited function. Note that based on Applicant's arguments filed on 9/29/04 the step of calculating the phase difference (308 in instant Fig.3) is not essential, so it needs to be clarified how the instant invention can perform the recited function.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 8, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements. See MPEP § 2172.01. The omitted elements are: N-BIT DELAY LINE (300 IN INSTANT Fig.3); N-BIT PARALLEL LATCH (302); N-BIT EDGE DETECT (304); N-TO-M BIT WEIGHTED ENCODER (306); PHASE DIFFERENCE CALCULATOR (308); ACCUMALATOR (310). In order for the phase/frequency comparator that generates a phase error responsive to a transition location signal, those omitted elements need to be included in the claims (as disclosed in the specification page 6, line 11 through page 7, line 23).

Claims 8 and 9 are rejected due to their dependencies on the base claim 1.

8. Claims 2-9 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. In claim 7, the omitted structural cooperative relationships are the structural and/or functional connections:

a) Between the phase detecting stage and the transition location signal, the phase error of the phase/frequency comparator; and

Art Unit: 2816

b) Between the encoding circuitry and the transition location signal, the phase error of the phase/frequency comparator. Claims 2-6 are similarly rejected because of the omitted structural cooperative relationships of elements. Furthermore, claims 2-9 recites the limitation "The apparatus" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Insofar as understood, that recited limitation appears to refer to the limitation "A phase/frequency comparator" in claim 1. Correction is required.

9. Claims 10-19 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. In claim 10, the omitted structural cooperative relationships are the structural and/or functional connections:

- a) Between the input of the phase/frequency comparator and the phase detecting stage, encoding circuitry, and accumulator; and
- b) Between the output of the controllable oscillator and the phase detecting stage, encoding circuitry, and accumulator.

Claims 11-19 are similarly rejected because of the omitted structural cooperative relationships of elements.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

Art Unit: 2816

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1, 2, 7, 20, 25, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Staszewski et al. (US Pat. 6,429,693; previously cited).

With regard to claims 1 and 20, Staszewski et al. discloses in Figs. 1-8 a phase/frequency comparator (804), and a method of use thereof, that generates a phase error (PHF) responsive to a transition location signal (by given the broadest reasonable interpretation; as shown in Figs. 1-6 during a transition of the reference oscillator FREF, the plurality of latch/registers 504 are accessed to obtain a snapshot 604 of the delayed replicas of the clock CKV 114 relative to the rising edge of the reference oscillator FREF 110, the snapshot signal can be seen as transition location signal).

With regard to claim 7, the phase/frequency comparator further comprises a phase detecting stage that generates a result ($Q(0)$ - $Q(L-1)$) that represents an instantaneous phase difference; and encoding circuitry (EDGE DETECTOR) coupled to the phase detecting stage; wherein the encoding circuitry converts a result of the phase detecting stage into a numerical phase difference value.

With regard to claim 2, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value.

Art Unit: 2816

With regard to claims 25 and 26, controlling an output frequency (RF OUT) of an oscillator (103) using the result of the phase comparison, wherein the first signal (CKV) is an output of the oscillator (RF OUT through 106).

12. Claims 10, 11, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Perrott et al. (US Pat. 6,630,868).

With regard to claim 10, Perrott et al. discloses in Fig. 3 a phase locked loop comprising a controllable oscillator (162); and a phase/frequency comparator (142, 154, 156, 158), wherein the phase/frequency comparator includes a phase detecting stage (142); encoding circuitry (154) coupled to the phase detecting stage; and an accumulator (156) coupled to the encoding circuitry.

With regard to claim 11, the phase detecting stage further comprises a tapped delay line (502s) having a plurality of outputs and configured to receive a first signal (CKV); and a parallel latch coupled to the plurality of outputs of the tapped delay line and configured to receive a second signal (110), wherein the parallel latch stores the values of the plurality of outputs of the tapped delay line in response to a transition in the second signal; and wherein the encoding circuitry converts the values stored in the parallel latch into a numerical phase difference value.

With regard to claim 16, the forward path includes additional control circuitry (150).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staszewski et al. in view of Brachmann et al. (US 6,351,154; previously cited).

With regard to claim 8, the above discussed the apparatus of Staszewski et al. meets all of the claimed limitations except that Staszewski et al. does not disclose the apparatus is implemented on a single monolithic integrated circuit. Brachmann et al. teaches in Fig.5 a similar apparatus can be implemented as integrated circuit (column 4, lines 20-33) as recited in the claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to implement that teaching with the apparatus of Brachmann et al. for the advantage of reducing additional cost when implemented within other circuits, e.g. ASIC, PLD, FPGA, PLL etc.

Claim 18 is rejected for similar motivation; note the above discussion with regard to claim 8.

Allowable Subject Matter

15. Claims 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not disclose or suggest a method of use thereof, as recited in claim 23, comprising the step of detecting a location of an edge in the snapshot of the first signal (304 in instant Fig.3); and mapping the location into a weighted numerical value (304 in instant Fig.3).

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai L. Nguyen whose telephone number is 571-272-1747 and Right Fax number is 571-273-1747. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The official fax phone number for the organization where this application or proceeding is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

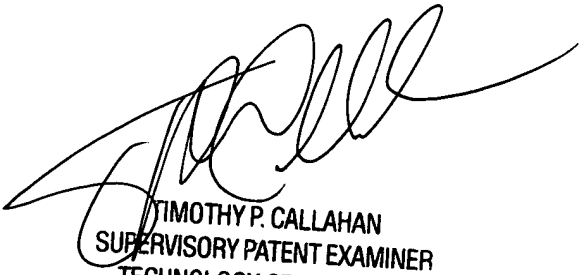
Art Unit: 2816

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HLN 
November 3, 2004


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SUPERVISORY PATENT EXAMINER
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